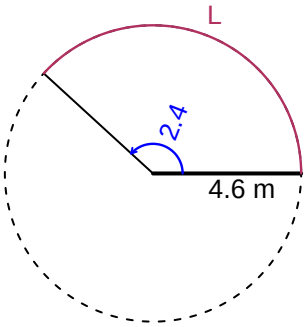
Name: Date:

Trig Final (TEST v635)

- You should have a calculator (like Desmos) and a unit-circle reference sheet.

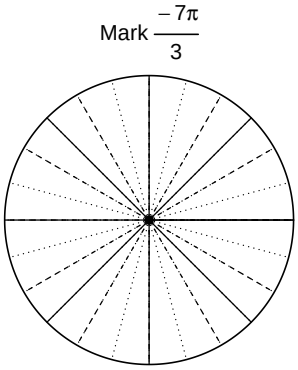
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 4.6 meters. The angle measure is 2.4 radians. How long is the arc in meters?

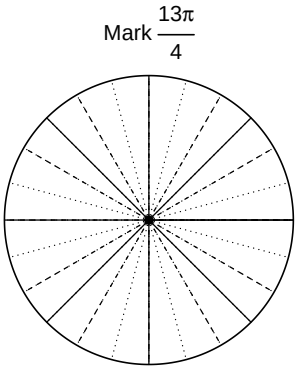


Question 2

Consider angles $\frac{-7\pi}{3}$ and $\frac{13\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{-7\pi}{3}\right)$ and $\cos\left(\frac{13\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\sin(-7\pi/3)$



Find $\cos(13\pi/4)$

Question 3

If $\tan(\theta) = \frac{-15}{8}$, and θ is in quadrant II, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with a midline at $y = 4.89$ meters, a frequency of 7.6 Hz, and an amplitude of 3 meters. At $t = 0$, the mass is at the midline and moving down. Write an equation to model the height (y in meters) as a function of time (t in seconds).